

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Makoto (JP 08-114802). Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Makoto, as applied to claim 1, and in view of Toshiya, et al. (JP 06-051308).

These rejections are respectfully traversed in view of the following discussion.

It is noted that the amendments are made only to more particularly define the invention and not for distinguishing the invention over the prior art, for narrowing the scope of the claims, or for any reason related to a statutory requirement for patentability.

Attached hereto is a marked-up version of the changes made to the specification and/or claims by the current Amendment. The attached page is captioned “**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**”

It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

I. THE CLAIMED INVENTION

Applicant's invention, as disclosed and claimed, for example by claim 1, is directed to a liquid crystal display panel.

The display panel includes a liquid crystal display panel held between an upper frame and a lower frame, the upper frame including a display window. The upper frame and the lower frame coupled to each other via a foldable U-shaped portion. (See Page 7, lines 7-9; Page 8, lines 14-16; and Figure 4).

One of the upper and lower frames includes a first protrusion formed in the vicinity

of its end, and the other frame of one of the upper and lower frames has a second protrusion formed in the vicinity of its end. The second protrusion is fitted inside the first protrusion. The first protrusion and the second protrusion are formed to differ from each other in a protruding direction.

Conventional liquid crystal displays include a lower frame and an upper frame coupled and fixed by many parts, e.g., spacers, screws and caulking, formed from different materials. However, the conventional displays with the large variety of parts and materials tends to increase manufacturing complexity and errors in positioning parts during assembly, and thus increase the cost of parts and labor. (See Page 2, lines 1-9; Page 3, lines 3-9; and Figures 1 and 2).

An aspect of the present invention includes a foldable U-shaped portion. This configuration decreases the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors, thus facilitating assembly. (Page 7, lines 26-28).

As a result of this inventive structure, a liquid crystal display is provided with a reduced profile, size, weight and cost. (See Page 3, lines 3-9).

II. THE PRIOR ART REJECTIONS

A. The 103(a) Rejection Based on Makoto

First, Makoto ("Makoto") fails to teach or disclose Applicant's invention. In particular, Makoto pertains to a holder of a plane display device where the holder includes a first holding member and a second holding member. The holding members are coupled via two hinges. (See Makoto at Abstract; and Figures 1 and 2).

Makoto is specifically directed to facilitate the handling of a plane display device and prevent the failure of the holder of the plane display device by detaining the plane display with detaining members disposed at the holding members and using a pair of fitting members. (See Makoto at Abstract).

In contrast, Applicant's invention does not have the same aim as Makoto. Instead, Applicant discloses a liquid crystal display, including a liquid crystal display panel held between an upper frame and a lower frame. The lower frame and the upper frame are coupled to each other via a foldable U-shaped portion. (See Page 7, lines 7-9).

Since, in Applicant's invention not Makoto as discussed above, the lower frame and the upper frame are coupled to each other via a foldable U-shaped portion, Applicant's invention efficiently decreases the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors. (Page 7, lines 26-28). This inventive aspect facilitates assembly and results in the formation of a liquid crystal display with a reduced profile, size, weight and cost of production. (See Page 3, lines 3-9).

For emphasis, Makoto discloses two conventional hinges for joining the two holding members where the hinges are separate components from the two holding members. In contrast, Applicant's invention recites a foldable U-shaped portion for coupling the upper frame and the lower frame. (See Page 8, lines 14-16; and Figure 4). The frame includes the upper frame and lower frame formed "into a configuration capable of folding" where, "[t]he configuration to be formed by the vacuum forming can be a groove having a cross section of U shape as shown in Fig. 4 (hereinafter, referred to as U-grooved portion of U-shaped portion)" (See Page 10, lines 14-24). Thus, the foldable U-shaped portion integrates the lower frame and the upper frame, particularly, as the U-shaped portion has the same thickness

as the frame, e.g., for example, as cited in dependent claim 7. (See Page 12, lines 11-13). Accordingly, this structure reduces the number of parts requiring assembly further minimizing errors involved with position accuracies and deviations during assembly and lowering cost. (See Page 7, lines 26-28).

In contrast, Makoto's invention is deficient and teaches a structure with a conventional hinge.

Accordingly, Applicant agrees with the Office Action that "Makoto does not explicitly disclose the shape of the hinge." However, Applicant traverses the assertion in the Office Action that, "it is common and known in the art to use U-shaped hinge to couple two frames together for several advantages such as for strong bonding. Therefore, it would be obvious to one of ordinary skill in the art at the time of the invention was made to use a U-shaped hinge in the device of Makoto so that a strong bond between the upper frame and the lower frame is established." (See Office Action at Page 4).

Despite this recitation, Makoto is specifically directed to facilitate the handling of a plane display device and prevent the failure of the holder of the plane display device by detaining the plane display with detaining members disposed at the holding members and using a pair of fitting members. As part of the holder, Makoto discloses a holding member attached to a second holding member via two conventional hinges. Applicant's invention, however, disclose an upper frame coupled to a lower frame via a foldable U-shaped portion where the frame forms a foldable configuration, including the foldable U shaped portion, e.g., for example, as cited in claim 9, for decreasing the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors.

Accordingly, Makoto does not provide the proper motivation to simply substitute a

conventional hinge with a U-shaped hinge as asserted in the Office Action. (Page 4, lines 1-6).

Further, as clearly indicated above, Makoto does not disclose any “said lower frame coupled to said upper frame via a U-shaped portion,” let alone, a “foldable” U-shaped portion. Accordingly, it is certainly not obvious using Makoto, in hindsight, to simply substitute a U-shaped hinge for the conventional V shaped folding hinge as suggested in the Office Action, particularly, where Applicant discloses that the frame is formed into a configuration of the foldable U shaped portion, e.g., for example, as cited in claim 9, in order to achieve the desired reduction in parts and related reduction of deviations in the sizes of the parts of the invention.

Nothing within Makoto’s invention of preparing a holder of a plane display device discloses, teaches or suggest the features of Applicant’s independent claim 1, including the lower frame coupled to the upper frame via a foldable U-shaped portion. (See Page 7, lines 7-9; Page 8, lines 14-16; and Figure 4). Rather Makoto discloses, in part, a structure, for attempting to facilitate the handling of a plane display device and prevent the failure of the holder of the plane display device without any foldable U-shaped portion as recited in Applicant’s claim 1. Consequently, Makoto’s conventional structure is unsuitable for achieving at least two objects of the invention, which include decreasing the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors, and thus facilitating assembly and producing a liquid crystal display with a reduced profile, size, weight and manufacturing cost. (See Page 3, lines 3-9; and Page 7, lines 26-28).

Therefore, one of ordinary skill in the art would not have cited this reference, absent

hindsight. Further, the Examiner provides no motivation other than to assert that it would be obvious to one having ordinary skill in the art at the time to use a U-shaped hinge despite the significantly different materials used to form the Makoto holder of the plane display device. Such an assertion does not take into account the distinct structural differences of the two inventions as indicated above.

For at least the reasons outlined above, Applicant respectfully submits that Makoto not disclose, teach or suggest all of the features of the independent claim 1 and any related dependent claims.

For the reasons stated above, the claimed invention, and the invention as cited in independent claim 1, should be fully patentable over the cited reference.

B. The § 103(a) Rejection of Claims 5 and 6

First, the references, separately, or in combination, fail to teach, disclose or provide a reason or motivation for being combined. In particular, as indicated above, Makoto pertains to a holder of a plane display device where the holder includes a first holding member and a second holding member. The holding members is coupled via two hinges. (See Makoto at Abstract; and Figures 1 and 2).

Makoto is specifically directed to facilitate the handling of a plane display device and prevent the failure of the holder of the plane display device by detaining the plane display with detaining members disposed at the holding members and using a pair of fitting members. (See Makoto at Abstract).

By contrast, Toshiya, et al. ("Toshiya") does not have the same aim as Makoto.

Toshiya discloses a liquid crystal display including a liquid crystal cell and

illuminating means supported in a frame with a light source supported by the frame and a fixing means without disclosing the shape of a hinge. The supporting frame is “constituted of resin molded goods obtained by vacuum molding or resin molded goods obtained by foaming.” (See Toshiya at Abstract). Accordingly, Toshiya is focused on providing a “small-sized, thin and durable liquid crystal display device which is easy to assemble.” (See Toshiya at Abstract). Nothing within Toshiya suggests a holder of a plane display device including the plane display with detaining members disposed at the holding members and using a pair of fitting members as disclosed in Makoto. Thus, Makoto teaches away from being combined with another invention, such as, Toshiya.

Therefore, one of ordinary skill in the art would not have combined these references, absent hindsight.

Second, even if combined, the references do not teach or suggest the features of independent claim 1, including the lower frame coupled to the upper frame via a foldable U-shaped portion.

Rather, Makoto, as indicated above, discloses a holder of a plane display device where the holder includes a first holding member and a second holding member. The holding members appear to be coupled by two hinges not any U-shaped portion, let alone, a foldable U-shaped portion as disclosed in Applicant’s invention. (See Makoto at Abstract; and Figures 1 and 2). Consequently, the Makoto conventional structure is unsuitable for achieving at least two objects of the invention, which is to decrease the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors. (See Page 3, lines 3-9; and Page 7, lines 26-28). Makoto does not teach, suggest or disclose a liquid crystal display, including the lower frame coupled to the upper frame via a foldable U-shaped portion.

Third, Toshiya does not make up for the deficiencies of Makoto. Instead, Toshiya discloses a liquid crystal display including a liquid crystal cell and illuminating means supported in a frame with a light source supported by the frame and a fixing means without disclosing the shape of a hinge. The supporting frame is “constituted of resin molded goods obtained by vacuum molding or resin molded goods obtained by foaming.” (See Toshiya at Abstract). Accordingly, Toshiya is focused on providing a “small-sized, thin and durable liquid crystal display device which is easy to assemble” not using a foldable U-shaped portion to decrease the number of parts requiring assembly and reduce the overall related number of deviations in component sizes and manufacturing errors as with Applicant’s invention. Thus, in Toshiya, the coupling of the frame is not disclosed nor is it a concern as indicated by the claims. Please note, Toshiya does not disclose or suggest any coupling means. (See Toshiya at Abstract; and Application, Page 7, lines 26-28). Consequently, Toshiya also does not teach, suggest or disclose Applicant’s invention.

Further, in regard to Applicant’s claim five (5), Applicant agrees that Makoto does not explicitly disclose “that the frames are vacuum formed of resin material” but Applicant traverses the Examiner’s assertion that combining Toshiya with Makoto yields Applicant’s invention. (See Office Action at Page 4). Although Toshiya discloses that the supporting frame is constituted of resin molded by vacuum molding, Toshiya does not disclose, teach or suggest, “integrally molding the upper frame and the lower frame to each other via a foldable U-shaped portion,” let alone, “vacuum forming the upper frame and the lower frame of a resin material” as disclosed in claim 5 of Applicant’s invention.

Finally, in regard to Applicant’s claim six (6), Applicant traverses the Examiner’s assertion that it would have been obvious to avail a proven technology, e.g., “the use of screen-printing as an electro-conductive pattern forming method.” (See Office Action at Page

5). Makoto and Toshiya, separately, or in combination, does not disclose, teach or suggest, “screen printing a conductive pattern on either the upper frame or the lower frame” as disclosed in claim 6 of Applicant’s invention.

Therefore, neither Makoto nor Toshiya teaches or suggests a liquid crystal display, including the lower frame coupled to the upper frame via a foldable U-shaped portion, as recited in claim 1, i.e., Applicant’s invention which decreases the number of parts requiring assembly and the overall related number of deviations in component sizes and manufacturing errors. (See Page 3, lines 3-9; and Page 7, lines 26-28).

For at least the reasons outlined above, Applicant respectfully submits that neither Makoto nor Toshiya teach or suggest all of the features of the independent claim 1 and dependent claims 5 and 6.

Regarding dependent claims 5 and 6, which depend respectively from claim 1, these claims are patentable not only by virtue of their dependency from the respective independent claim, but also by the additional limitations they recite.

For the reasons stated above, the claimed invention, and the invention as cited in independent claim 1, should be fully patentable over the cited references.

III. FORMAL MATTERS AND CONCLUSION

The title has been amended to be more indicative of the invention to which the claims pertain and to overcome the Examiner’s objection thereto.

In view of the foregoing, Applicant submits that claims 1 and 5-18, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above

application to issue at the earliest possible time.

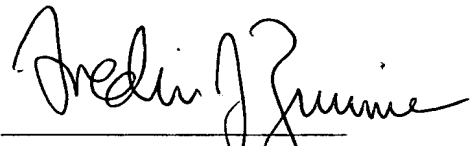
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Date: _____

1/22/03

Respectfully Submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Title:

The title has been amended:

LIQUID CRYSTAL DISPLAY WITH COUPLED FRAME AND METHOD OF
FABRICATING THE SAME [LIQUID CRYSTAL DISPLAY AND METHOD OF
FABRICATING THE SAME] (Amended)

In the claims:

Claims 2-4 have been canceled without prejudice or disclaimer.

The following claims have been amended:

1. (Amended) A liquid crystal display [having] including:

a liquid crystal display panel held between an upper frame and a lower frame, said upper frame [having] including a display window, wherein said upper frame and said lower frame are coupled to each other via a foldable U-shaped portion[;],

wherein [either] one of said [frame] upper and lower frames [has] includes a first protrusion formed in the vicinity of its end, and the other frame of said one of said upper and lower frames has a second protrusion formed in the vicinity of its end, wherein the second protrusion [to be] is fitted [to the] inside [of] said first protrusion[;], and

wherein said first protrusion and said second protrusion are formed to differ from each other in a protruding direction.

5.(Amended) A method of fabricating a liquid crystal display having a liquid crystal display panel held between an upper frame and a lower frame, said upper frame having a display

window, [wherein] comprising:

integrally molding said upper frame and said lower frame [are integrally molded to be] coupled to each other via a foldable U-shaped portion; and

vacuum forming said upper frame and said lower frame [are vacuum formed] of a resin material.

6. (Amended) The method of fabricating a liquid crystal display according to claim 5,

[wherein] further comprising:

screen printing a conductive pattern on either said upper frame or said lower frame [has a conductive pattern formed thereon; and said conductive pattern is formed by screen printing].